Southern Forestry Notes



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## ANNOSUS ROOT ROT SURVEY

Although Fomes annosus root rot has seldom been troublesome in thinned natural stands or in unthinned stands it has caused sufficient mortality in some thinned southern pine plantations to create widespread concern for the future of the South's planting program. During 1961 an extensive survey by the Southeastern and Southern Forest Experiment Stations took data on 84,000 trees on 476 plots from Virginia to Texas. Average damage in thinned natural stands was fairly low, but indications were that root rot will importantly affect the management of many plantations.

In thinned stands the proportion of trees dead or dying of root rot was 2.8 percent in planted loblolly, 2.2 percent in planted slash, and 0.07 percent in natural slash. Variation among specific areas was great--some had almost no damage and others consistently high losses. In some thinned plantations 30 percent or more of the remaining trees were dead or dying. Average losses were greater in the Southeast than in the Midsouth, and also were greater in the northern than in the southern halves of the Gulf States.

Significant correlations were found between proportion of trees attacked and several site factors. Attack was greatest on former cropland. In general, it increased with years since thinning and with the number and frequency of thinnings. Losses were heaviest in plots with

coarse-textured A-horizons and tended to increase with increasing depth of the A-horizon. Plots on slopes, however slight, suffered more than those on flat sites. Intensity increased with depth of litter.

These findings give the forest manager some indication of sites most likely to sustain important losses. But they are primarily guides to needed research on root rot control.--A.F. Verrall.

## REMOVING UNDERSTORY HARDWOODS FROM PINE STANDS IMPAIRS MOISTURE RELATIONS

A decline in weight and moisture-holding capacity of litter-humus and an increase in evaporation from the surface layer of soil followed removal of understory hardwoods from pine stands in the Ouachita Mountains. Growth of overstory pine was not markedly affected.

These observations were made on 3 pairs of plots in northern Arkansas. All plots had shortleaf pine overstories with basal areas ranging from 80 to 100 square feet per acre. A hardwood understory averaging 30 square feet of basal area per acre was completely removed from one plot in each pair.

After three growing seasons litter-humus averaged 5,070 pounds (oven-dry) per acre on treated plots and 13,090 on untreated. The difference is proportionally greater than the amounts of basal area removed. Probably hardwood removal not only curtailed litter production but also opened the stand enough to increase oxidation and decomposition of litter already present.

Detention storage of the litter-humus (equal to free moisture lost between saturation and 30 minutes of drying on racks) was 0.026 area-inch on treated plots and 0.103 on untreated. Retention storage (equal to the further moisture lost upon oven-drying) was 0.050 area-inch for treated plots and 0.164 for untreated.

The differences resulted primarily from the smaller amount of litter on the treated plots, but hydrologic properties of the litter also varied. Thus, 1 pound (oven-dry) of the predominantly pine litter on treated plots held 3.4 pounds of moisture (detention plus retention), while a pound of pine-hardwood litter from the untreated plots held 4.6 pounds. This difference was due primarily to changes in detention storage. Samples of equal weight (representing

field weights from 11,025 to 2,205 pounds per acre air-dry) showed that pine-hardwood litter held 44 percent more moisture in detention than pine litter. Detention storage per pound of litter of both types increased with increases in litter depth, but retention and total storage decreased. The pine litter lost 90 percent of its moisture during 5 days of drying in the laboratory; the pine-hardwood litter, which tended to be compact when moist, required 12 days. Drying time increased with litter depth and was unaffected by litter type.

Removal of hardwoods may also have speeded evaporation losses. In two wet years, moisture contents of the surface 3 inches of soil were higher on treated than on untreated plots, presumably because there was less litter to absorb rain. In a dry year, soil moisture was greatest on untreated plots, where the deeper humus slowed evaporation.

These changes in moisture relations are in an undesirable direction, and there were no gains in timber growth. Hence removal of understory hardwoods cannot yet be recommended on droughty mountain soils.--*D.R. Bower.*

## FOREST GRAZING IN THE ARKANSAS OZARKS

About 23 percent of the forest land in the Ozark region of northwest Arkansas is grazed by cattle. This estimate is based upon information compiled during a 1959 forest survey of 24 Ozark counties. The grazing data were gathered on a systematically distributed sample of 266 plots.

Commercial forest land makes up 7.0 million acres, or 66 percent of the total land area in the Ozarks, according to the survey. Some 5.4 million acres of the forest area is in hardwood cover types; 1.1 million is occupied by shortleaf pine, either pure or in mixture with various hardwoods; and the rest is in eastern redcedar, most commonly in association with oaks and hickories.

Grazing was evident on 16 percent of the pine acreage, 22 percent of the hardwood, and 49 percent of the redcedar. Evidences of grazing were considered to be grazed vegetation, cattle droppings, and cattle trails or tracks.

Only 15 percent of the well-stocked forest and 32 percent of the medium-stocked area showed evidence of grazing. But 50 percent of the poorly stocked acreage was used by cattle. Stands were regarded as well stocked when the percentage of full tree stocking was 70 or above, medium stocked when the percentage was 40 to 69, and poorly stocked when the percentage was less than 40.

The use of forest range was also found to vary by class of ownership. Thirty-one percent of the woodland acreage owned by farmers was grazed, in contrast to 22 percent of the area held by other private owners. Only 6 percent of the publicly owned forest acreage showed signs of grazing.--*H.S. Sternitzke* and *L.K. Halls.*

## SOUTHERN PINES AND SWEETGUMS DO NOT MIX

Planted southern pines have outgrown sweetgum by at least 3 to 1 on upland sites in north Mississippi.

Loblolly, slash, and shortleaf pines were planted in alternate rows with sweetgum on an old cornfield, an abandoned pasture, and on newly cleared land. In addition, all four species were planted in pure stands on the same three sites.

After 5 years, survival averaged 87 percent for loblolly pine, 79 for sweetgum, 51 for shortleaf pine, and 37 percent for slash pine. Within species, there were virtually no survival differences between pure and mixed stands.

The pines outgrew and are overtopping the gums. Naturally seeded sweetgums and sprouts from native stock have outstripped the planted gums but have not grown so fast as the pines. At age 5 years, loblolly pine averaged 11.3 feet in height; slash pine 10.0 feet; shortleaf pine 7.9 feet; and planted sweetgum 2.6 feet. In mixed plantings the sweetgums occupy the understory and are expected to fill failed spots among the pines.--*Russell M. Burns.*

## RECENT PUBLICATIONS


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*Jewell, F.F., True, R.P., and Mallett, S.L. *Histology of Cronartium fusiforme in slash pine seedlings.* Phytopathology, September 1962, pp. 850-858.

*McLemore, B.F. *Predicting seed yields of southern pine cones.* Journal of Forestry, September 1962, pp. 639-641.

*Siegel, W.C. *Federal Land Bank timber loans in the Midsouth.* Occasional Paper 194, 15 pp.

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*Toole, E.R. *Tupelo lesion caused by Fusarium solani.* USDA Plant Disease Reporter, October 15, 1962, pp. 732-733.

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*Yates, H.O., III, and Beal, R.H. *Nantucket pine tip moth.* USDA Forest Pest Leaflet 70, 4 pp.


*Copies are available at the Southern Station.